Arizona State Senate
Issue Brief

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STEM CELL RESEARCH

INTRODUCTION

While most cells of the human body are committed to a specific purpose, stem cells are unspecialized and can be induced to become cells with special functions (e.g. heart muscle). Unlike most cells, these cells can also divide and renew themselves for long periods of time. Stem cells can be classified as either adult or embryonic stem cells.

Adult stem cells are found in small numbers in various tissues or organs of the human body, including bone marrow, umbilical cord blood, blood vessels, skeletal muscle, skin, the brain and the liver. In a living organism, adult stem cells help maintain and repair their surrounding tissues. Much of the research to date on adult stem cells shows a tendency for these unspecified cells to adapt into cells similar to the tissues or organs in which they originate. However, some researchers believe further study will generate techniques to allow adult stem cells to adapt into different types of cells. Because research is still developing, it is unclear how many different types of cells can be generated from adult stem cells.

Embryonic stem cells are typically derived from eggs that have been fertilized in vitro and donated for research purposes, from certain fetal cells or from existing stem cell lines. A "cell line" is made up of unspecified embryonic stem cells that have been cultured and are then grown in a laboratory environment. Embryonic stem cells may also be derived using somatic cell nuclear transfer, sometimes known as "therapeutic cloning," although research using this technique with human cells is still in its early stages. Embryonic stem cells are capable of adapting into almost any type of cell and, similar to adult stem cells, can replicate themselves.

Some researchers believe that, because both adult and embryonic stem cells allow for close study of the way cells grow and differentiate, they may enhance understanding of the cause of genetic diseases and result in new approaches to treatment. In addition, stem cells may be useful for testing new drugs as well as for generating new cells and tissues that could be used for organ and tissue replacement and transplant. Some researchers believe that with additional research, stem cells will be able to differentiate into cells that can be used to treat conditions such as Alzheimer's

disease, Parkinson's disease, diabetes, cancer, spinal cord injuries and heart disease. Because embryonic stem cells can adapt into almost any type of cell, some researchers believe they will be more useful for these purposes than adult stem cells.

POLICY CONSIDERATIONS

The policy discussion regarding the practice of stem cell research is primarily focused on embryonic stem cell research. Opponents of this research believe that an embryo represents the early stages of human life and is, therefore, fully human. They argue that, because embryonic stem cell research is dependent upon the destruction of the human embryo, the research equates to the destruction of human life. Opponents of embryonic stem cell research may, however, support the use of adult stem cells for research because it does not involve the destruction of embryonic cells. In addition, some researchers believe that future techniques will allow for the extraction of embryonic stem cells without the destruction of the embryo, which may mitigate some concerns regarding research with embryonic stem cells.

Supporters of embryonic stem cell research argue that the potential scientific and health benefits of the research, including the potential development of new therapies and cures for diseases and conditions, are so great that it would be unethical not to pursue them. They also argue that, because other nations are pursuing embryonic stem cell research, restrictions in the United States will not stop the practice but only direct it elsewhere.

FEDERAL FUNDING

On August 9, 2001, President George W. Bush established a policy limiting federal funding for embryonic stem cell research to stem cell lines that were in existence on that date. In addition, the lines must come from a voluntarily donated embryo created for reproductive purposes but not utilized. Research on adult stem cells does receive federal funding without restrictions beyond the general guidelines for research on human subjects. In Federal FY 2005, the federal National Institutes of Health (NIH) provided a total of $239 million towards human stem cell research, of which $40 million was for embryonic stem cell research on permitted lines. The NIH also spent an additional $370 million in Federal FY 2005 on nonhuman stem cell research. Private and state funding of embryonic stem cell research is not affected by the federal policy.

In July 2006, Congress passed the Stem Cell Research Enhancement Act of 2005, which required the Secretary of Health and Human Services to conduct and support research utilizing embryonic stem cells as long as the human embryos used in the research: 1) were donated from in vitro fertilization clinics; 2) were originally created for the purposes of fertility treatment but were in excess of the needs of the donors; 3) would never be implanted in a woman and would otherwise have been discarded; and 4) were donated with written and informed consent and without financial or other inducements. This legislation allowed embryonic stem cell research beyond what is permitted under the President's 2001 policy. President Bush vetoed the bill on July 19, 2006.

STATE POLICIES

States may set their own policies regarding stem cell research and its funding. According to the National Conference of State Legislatures (NCSL), state approaches to the issue vary widely. Currently, California, Connecticut, Illinois, Maryland, Massachusetts and New Jersey have publicly funded stem cell research programs, including research on embryonic stem cells. Ohio and Indiana have provided public funding for adult stem cell research.

Seventeen states have developed programs to encourage the donation of umbilical cord blood, which is a source of stem cells. NCSL also reports that almost half of the states have laws prohibiting some form of embryonic research, but the effect on embryonic stem cell research depends on how the law is structured. For example, South Dakota prohibits research on embryos regardless of their source and Louisiana prohibits research on in vitro fertilized embryos. Thirteen states have laws prohibiting

human cloning but six of these allow certain types of research cloning (e.g. therapeutic cloning, which can be used for embryonic stem cell research). Other states have varying restrictions on embryo research.

Related Arizona Laws

Currently, Arizona law is silent on stem cell research itself. Laws 2005, Chapter 146, created a Stem Cell Research Study Committee to study issues connected to stem cell research.

Statute requires health professionals to notify pregnant patients about options related to umbilical cord blood stem cells and requires hospitals to allow women to arrange for umbilical cord blood donations. The Department of Health Services is required to publish and distribute a pamphlet covering cord blood issues. Existing law also prohibits research on embryos or fetuses resulting from an abortion as well as the use of public monies for human somatic cell nuclear transfer, which is sometimes referred to as a type of cloning and is one of the techniques used to isolate embryonic stem cells.

ADDITIONAL RESOURCES

- National Institutes of Health Stem Cell Information http://stemcells.nih.gov/index.asp
- National Conference of State Legislatures http://www.ncsl.org
- Related Arizona Revised Statutes: A.R.S. §§ 32-3212, 35-196.04, 36-112 and 36-2302